

Serial No. 09/944,109

REMARKS

It is respectfully requested that the Amendments to the specification be entered, prior to examination of the application on the merits. The Amendments to the specification are to correct minor typographical errors. No new matter has been added.

Respectfully submitted,

NOV 13 2001

Date


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SHOULD ADDITIONAL FEES BE NECESSARY IN CONNECTION WITH THE FILING OF THIS PAPER, OR IF A PETITION FOR EXTENSION OF TIME IS REQUIRED FOR TIMELY ACCEPTANCE OF SAME, THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE DEPOSIT ACCOUNT NO. 19-0741 FOR ANY SUCH FEES; AND APPLICANT(S) HEREBY PETITION FOR ANY NEEDED EXTENSION OF TIME.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

[0007] The devices of Frei, Asai and Taylor, however, can also result in the appearance of flow lines in the final product. To combat this problem, U.S. Patent Nos. [5,784,234] 5,783,234 and 5,840,231, both to Teng and incorporated herein by reference, disclose an even more complex apparatus to recombine the individual streams of molten resin after they are split and prior to entering the cavity gate, so as to minimize the appearance of flow lines. The apparatuses of Frei, Asai, Taylor and Teng, however, all require careful machining and make a resin colour change a laborious and time consuming proposition, as the intricate surfaces must be carefully cleaned before a new colour resin can be introduced.

[0051] The enlarged opening 36 and the cooperation of transition zone 38 and valve neck 4 advantageously permit a larger aperture ring gate 24 to be achieved than is possible with the prior art and without the need for the spreading or distribution means of the prior art, such as those shown variously in U.S. Patent Nos. 4,340,353 to Mayer, 5,324,190 to Frei, 5,460,763 to Asai, 4,394,117 to Taylor, No. [5,784,234] 5,783,234 to Teng and 5,840,231 to Teng, each of which is incorporated herein by reference. None of these references teaches the use of a transition 38 and enlarged opening 36 to permit a relatively small diameter melt channel 12 to provide melt to a larger aperture part P, as is shown in Figure 5, while permitting the melt to flow freely, in an unrestricted manner, into the cavity, thereby permitting improved part quality.

[0053] One skilled in the art will understand that other modifications are possible. For example, the use of a guide spigot 3 is desirable but not necessary. Further, the actuation of valve pin 1 and its movement from the "open" to "closed" positions may be achieved by

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other known means. See, e.g., U.S. Patent No. 4,053,271 to Gellert; U.S. Patent No. 5,916,605 to Swenson; U.S. Patent No. 5,948,450 to Swenson; U.S. Patent No. [5,948,661] 5,984,661 to Vorkoper; U.S. Patent No. 6,159,000 to Puri; and U.S. Patent No. 6,086,357 to Steil, all of which are incorporated herein by reference.